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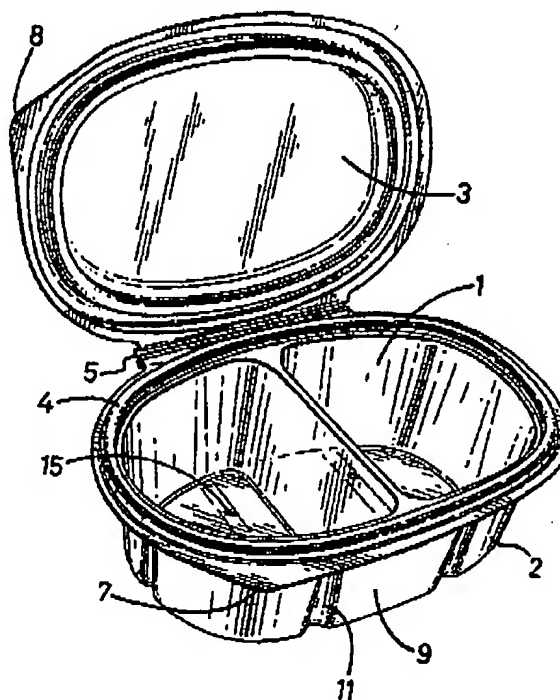
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(21) International Application Number: PCT/GB99/03338 (22) International Filing Date: 7 October 1999 (07.10.99) (30) Priority Data: 9822101.3 12 October 1998 (12.10.98) GB 60/110,660 2 December 1998 (02.12.98) US 9901176.9 20 January 1999 (20.01.99) GB (71)(72) Applicant and Inventor: CLARKE, Kevin, William, Joseph (GB/GB); Yaffies, Clewens Lane, Waltham Chase, Nr Southampton, Hampshire SO32 2LP (GB). (74) Agent: BROOKS, Nigel; Hill Hampton, East Meon, Petersfield, Hampshire GU32 1QN (GB).	(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>	

(54) Title: **THERMALLY INSULATED MICROWAVE COOKING CONTAINER**

(57) Abstract

A container comprising an inner thermoformed vessel (1) and an outer thermoformed vessel (2), arranged the one within the other. The side walls (9) of the outer forming (2) surround the side walls (10) of the inner forming (1). The outer side walls has inwardly projecting ribs (11), which abut the inner side walls (10) to maintain an air gap (12) between the formings, with the formings being centred with respect to each other. The air gap is present between the bases (13, 14) of the inner and outer formings, with the outer forming being provided with ribs in its base also. In use food in the container can be heated in a micro-wave oven until hot. The air gap separates a handler's fingers from direct thermal contact with the hot food so that the container remains comfortable to handle.



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THERMALLY INSULATED MICROWAVE COOKING CONTAINER

The present invention relates to a container, particularly, though not exclusively, a disposable container in which food can be heated.

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It is known for food to be heated in plastics material containers in micro-wave ovens and indeed conventional ovens, provided the melting point of the material is sufficiently high.

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Polypropylene is generally an economic material to make containers from. However, a simple container suffers from the inconvenience that when containing hot material, it conducts the heat to fingers holding it.

15

The object of the present invention is to provide a container having a degree of thermal insulation in its side walls.

According to the present invention there is provided a food packaging container comprising:

- a first plastics material vessel;
- 20 a second vessel arranged with its side wall(s) surrounding the side wall(s) of the first vessel;
- projecting ribs on the sides and/or bases of either the first vessel or the second vessel or both vessels, the ribs being outwardly projecting on the first vessel and/or inwardly projecting on the second vessel, whereby heat from the contents of the
- 25 container, i.e. within the inner, first vessel, does not directly heat the entire wall(s) of the outer, second vessel.

30

Preferably the two vessels are secured together. While this securement can be by inter-engagement of the rims of the vessels, it is preferably by bonding connection of the vessels, conveniently at their bases.

The bonding can be by means of adhesive. Alternatively, it can be by welding. Preferably the welding is at the ribs in the base of either vessel.

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Conveniently the first vessel may be provided with an integral lid connected to a rims of the vessel by a living hinge. The lid would be shaped at its edge to co-operate with the rim of the vessel so that the lid remains closed. Alternatively a lid may be provided on the second vessel.

5

Usually both vessels will be manufactured from polypropylene material. While both forming may be of a translucent grade or a coloured grade, typically the inner one will be of a translucent grade, while the outer will be of a coloured grade.

10 To help understanding of the invention, two specific embodiments thereof will now be described, by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a container of the invention when open;

Figure 2 is a cross-sectional end view of the container when closed on the line

15 II-II in Figure 3;

Figure 3 is a cross-sectional plan view of the container on the line III-III in Figure 2;

Figure 4 is a top view of another container according to the invention;

Figure 5 is a side view of the container of Figure 4;

20 Figure 6 is a top view of a variant of the container of Figure 4;

Figure 7 is a side view of the container of Figure 6;

Figure 8 is a top view of a second variant of the container of Figure 4; and

Figure 9 is a side view of the container of Figure 8.

25 Referring to Figures 1 to 3 of the drawings, the container there shown is a two compartment container for take-away food to be heated in a microwave oven.

The container has an inner thermoformed vessel 1 and an outer thermoformed vessel 2, arranged the one within the other. Both formings 1,2 are of polypropylene
30 material, the inner one being of a translucent grade and the outer of a coloured grade.

The inner forming has an integral lid 3 connected to a rim 4 of the forming by a living hinge 5. The lid is conventionally shaped at its edge 6 to co-operate with the rim 4 so that the lid remains closed. The rim and lid are provided with tabs 7, 8 to be

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grasped for opening of the lid. This lid is optional and on embodiments not shown may not be present.

Side walls 9 of the outer forming surround the side walls 10 of the inner forming. The outer side walls have inwardly extending ribs 11, which abut the inner side walls to maintain an air gap 12 between the formings with the formings being centred with respect to each other. The air gap is present between the inner and outer bases 13, 14, with the ribs extending across the outer base.

At four spaced positions 15 on the ribs in the outer base 14, the inner base 13 is ultrasonically welded to the outer base.

In use, the food in the container can be heated in a micro-wave oven. When the container is subsequently handled the air gap separates the user's fingers from direct conductive thermal contact with the hot food so that the container remains comfortable to handle.

Referring now to Figures 4 and 5, the container 100 there shown is also a container for take-away food to be heated in a micro-wave oven. This container has an inner thermoformed vessel 101 and an outer thermoformed vessel 102 arranged one within the other. Both formings 101, 102 are also made from polypropylene material. Again the inner vessel has an integral lid 103 connected to a rim 104 of the forming by a living hinge 105. This lid is optional and not necessary to the functioning of the insulation of the vessel.

25

The base 114 of the outer forming 102 has inwardly extending ribs 115 which abut the base 113 of the inner forming 101 maintaining an air gap between the formings. At at least four positions (not shown) on the ribs, the inner forming 101 is ultrasonically welded to the outer forming 102. The side walls 109, 110 of the inner and outer formings are angled such that they converge at their rims 104 maintaining an air gap between the two formings. As above after heating of food placed in this container, the outer surface of the vessel is cool to the touch as it is not in direct conductive thermal contact with the hot food.

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Turning now to Figures 6 and 7, the container 200 there shown is similar to the one shown in Figures 4 and 5, except that the inner forming 201 includes a divider 216. Similarly with the container 300 shown in Figures 8 and 9, the container there shown includes two dividers 316, 317 to allow three separate foods to be heated in the same container. Again the lids in the container are not essential to the functioning of the invention.

The invention is not intended to be restricted to the details of the above described embodiment. For instance, the container could be a cup or bowl. Not only can the translucent and coloured materials of the formings be changed, but also other plastics materials can be used.

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CLAIMS:

1. A food packaging container comprising:
 - a first plastics material vessel;
 - a second vessel arranged with its side wall(s) surrounding the side wall(s)
5 of the first vessel;
 - projecting ribs on the sides and/or bases of either the first vessel or the second vessel or both vessels, the ribs being outwardly projecting on the first vessel and/or inwardly projecting on the second vessel, whereby heat from the contents of the container, i.e. within the inner, first vessel, does not directly
10 heat the entire wall(s) of the outer, second vessel.
2. A container as claimed in claim 1, wherein the two vessels are secured together.
3. A container as claimed in claim 2, wherein the securement is by inter-engagement of rims of the vessels.
- 15 4. A container as claimed in claim 2, wherein the securement is by bonding connection of the vessels
5. A container as claimed in claim 4, wherein the bonding of the vessels is at their bases.
6. A container as claimed in claim 4 or claim 5, wherein the bonding is by means
20 of adhesive.
7. A container as claimed in claim 4 or claim 5, wherein the bonding is by means of welding.
8. A container as claimed in claim 7, where the welding is ultrasonic welding.
9. A container as claimed in any preceding claim, wherein the first vessel is
25 provided with an integral lid connected to the rim of the vessel by a living hinge.
10. A container as claimed in claim 9, wherein the lid is shaped at its edge to co-operate with the rim of the vessel so that the lid remains closed.
11. A container as claimed in any one of claims 1 to 8, wherein a lid is provided
30 on the second vessel.
12. A container as claimed in any preceding claim, wherein the vessels are of polypropylene material, the first vessel of a translucent grade and the second vessel of a coloured grade.

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13. A container as claimed in any preceding claim, wherein the side walls of the first and second vessels are angled such that they converge at their rims, maintaining an air gap between the two vessels.
14. A container as claimed in any preceding claim, wherein the first vessel
5 includes one or more dividers such that more than one foodstuff can be heated in the same container without contamination.

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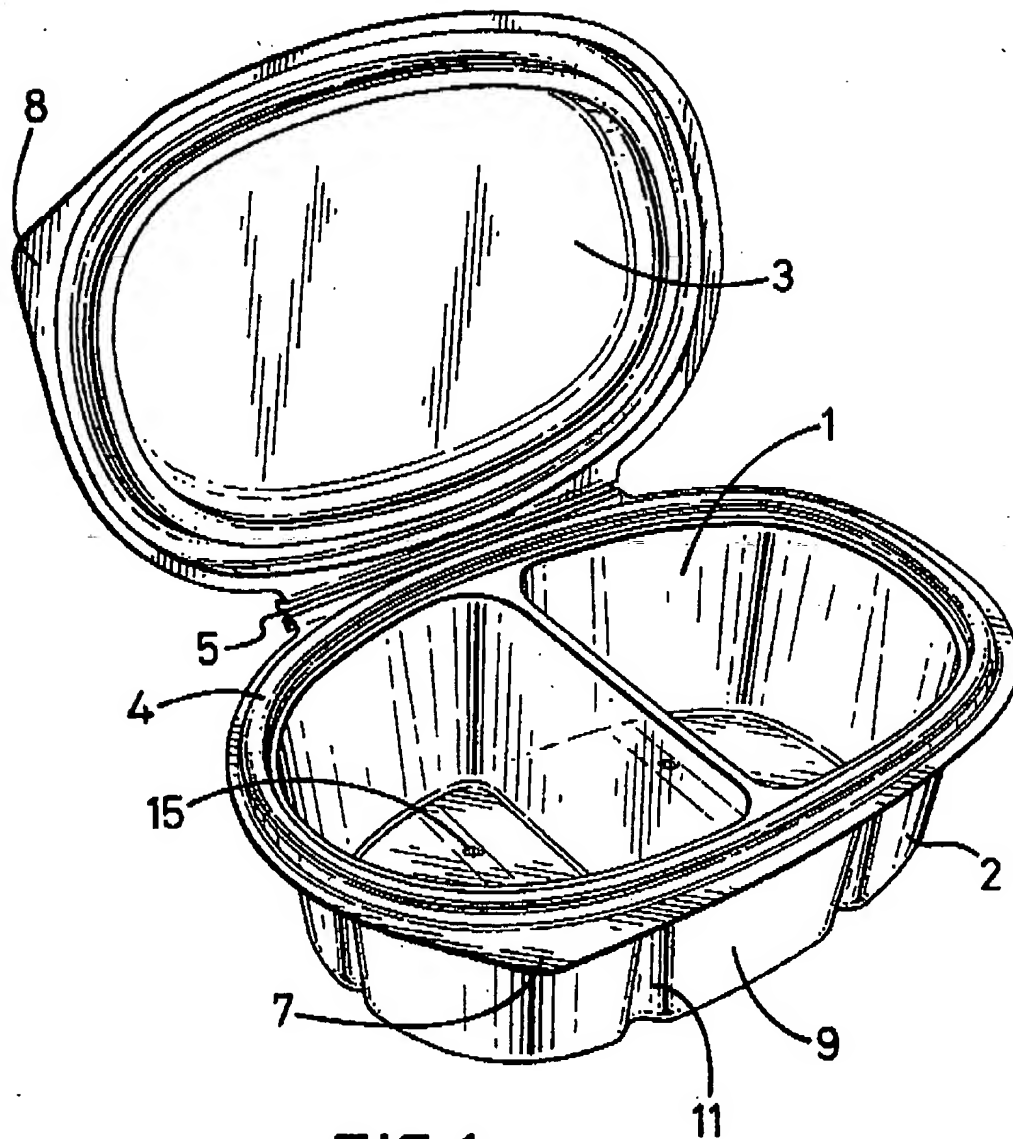
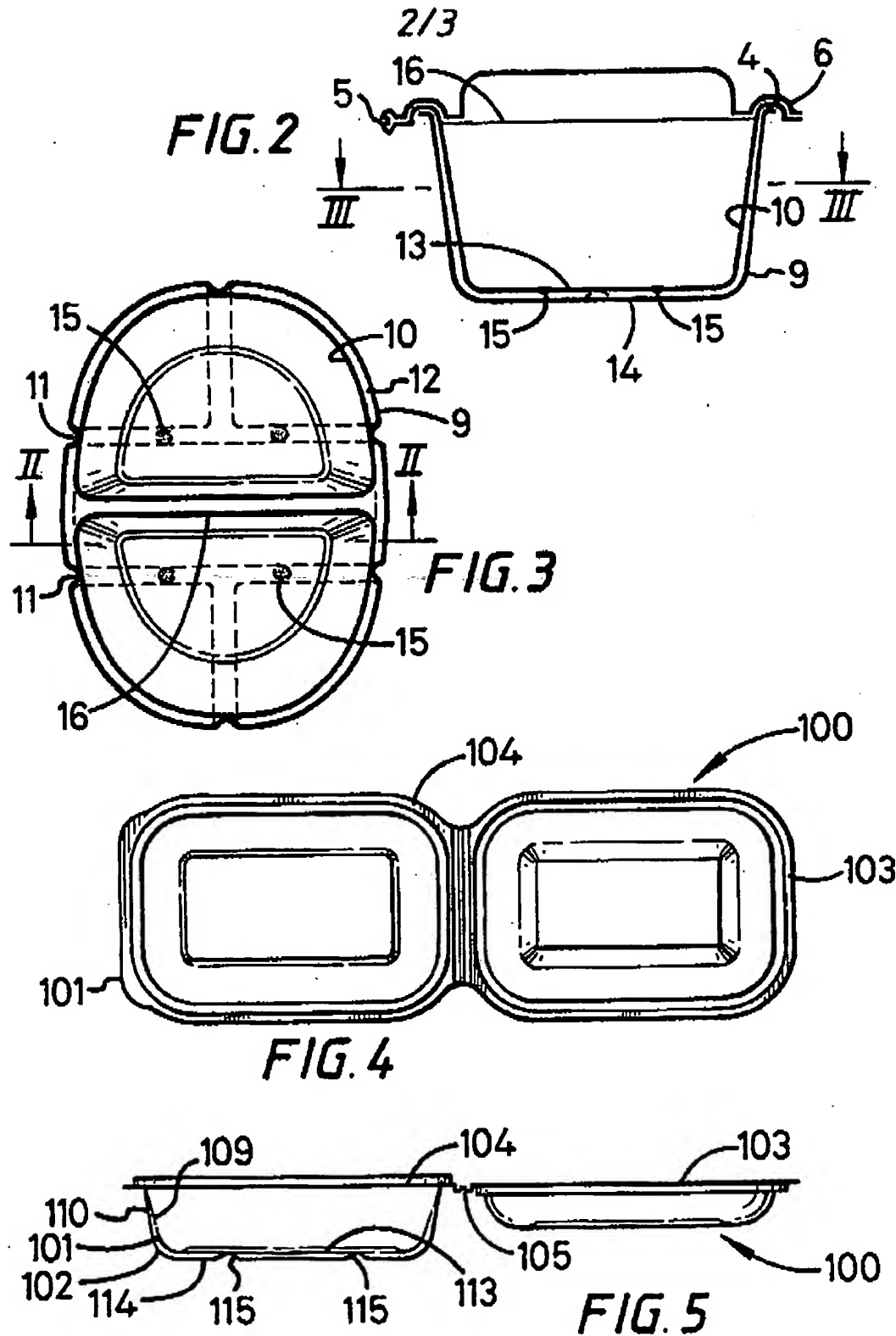


FIG. 1

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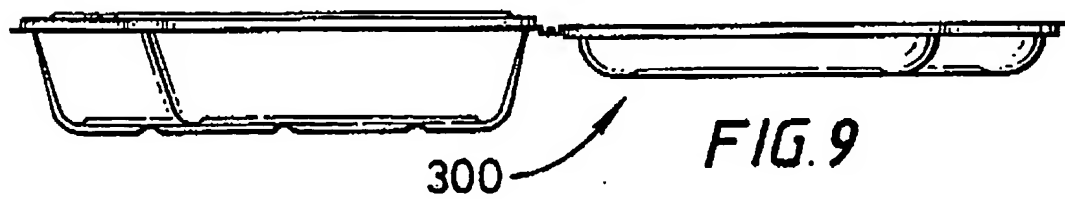
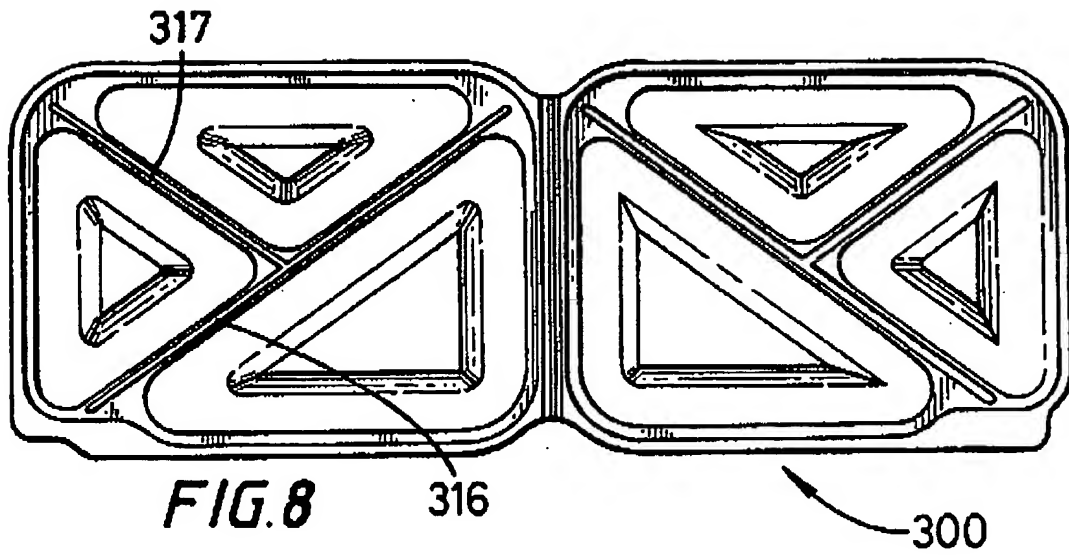
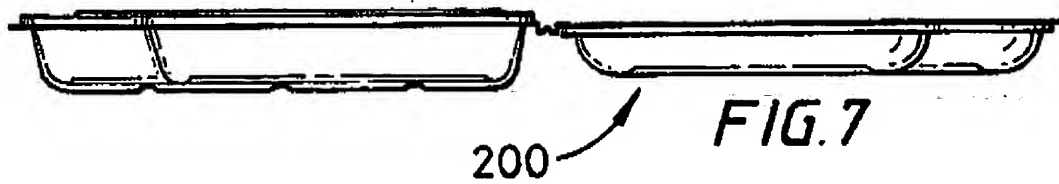
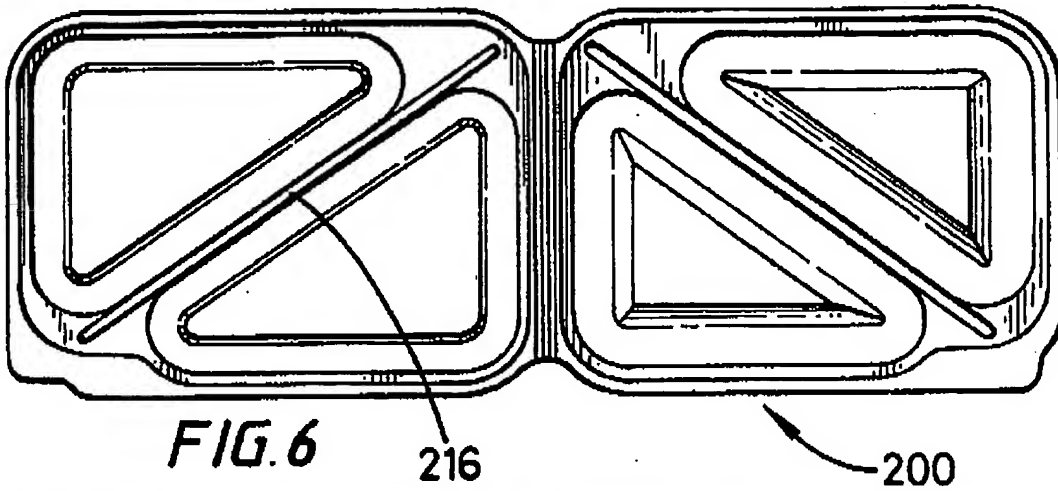
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INTERNATIONAL SEARCH REPORT

Inter. and Application No
PCT/GB 99/03338A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D43/16 B65D81/34 B65D81/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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